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56. The process according to claim 51, wherein said surface is comprised of metal, organic, or inorganic material.

57. A method of using the inorganic resin composition according to claim 29 as a binder, coating, surfacing agent, adhesive, cementing agent.

58. A method of using the inorganic resin composition according to claim 47 as a binder, coating, surfacing agent, adhesive, cementing agent.

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59. The method of claim 58, wherein the shaped form has a foamed structure.--

#### ***REMARKS***

The substitute specification attached hereto is identical to the specification originally filed. The reason the substitute specification is submitted is, according to the Office action, because portions of the specification are blurred and unreadable. There is no new matter in the substitute specification. Applicants note that the substitute specification includes the annexes to the International Search Report (that

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is, substitute pages for pages of the originally filed international application). The annexes carry the stamp "AMENDED SHEET" at the bottom of each page.

The present claims are 29-59, supported by the original claims.

Claims were rejected under 35 U.S.C. § 112, first paragraph. Reconsideration is respectfully requested.

With respect to the term "strongly acidic," the term is not found in the new claims.

With respect to the sentence found on page 20, lines 11-14, of the specification, applicants respectfully submit that this is irrelevant to satisfying the requirements of the first paragraph of § 112 of the statute. Since the language at issue is not found in the claims, it cannot be used as a basis to support a rejection under § 112. *Ex parte Erlich*, 3 USPQ2d 1011 (BPA&I 1987). Claims were rejected under 35 U.S.C. § 112, second paragraph. Reconsideration is requested in view of the changes to the original claims reflected in the new claims 29-59.

Reconsideration of the rejection under 35 U.S.C. § 101 is respectfully requested, since the "use" claims originally filed are replaced, hereby, with "method-of-using" claims.

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Claims were rejected under 35 U.S.C. § 102 and 35 U.S.C. § 103 based on DE 2456524 (hereinafter referred to as "D1"). Reconsideration is respectfully requested.

Based on the subject submitted, hereby, the subject of the instant invention is not relevant to the prior art, in terms of material composition, pH value, setting reactivity at room temperatures, characteristics of the product, even the field of application. The instant claims are in the line with the original claims, but are more accurate by reciting the "aqueous solution of metal phosphate *containing phosphoric acid.*".

The presently claimed invention provides a novel material composition comprising an acidic aqueous solution of metal phosphate containing phosphoric acid, and oxy-boron compound, and a wollastonite compound. Because it contains phosphoric acid, the aqueous solution of the presently claimed invention is acidic, having a pH = 0 - 2. When this solution is mixed with the wollastonite, having pH = 10 - 12, the composition of the presently claimed invention has setting reactivity and can harden at ambient temperature conditions, resulting in a strong, stable and durable material (specification, page 14, lines 9-14).

On the other hand, D1 discloses a material composition comprising a dispersion of silicate mineral and a dispersing solution (Dispersion von Silikaten und

Dispersionsmittel) where the silicate mineral may include wollastonite, and the dispersing solution may comprise solutions of phosphate glass or alkali silicates and borates in water (D1, page 7, last 5 lines and page 8, first 5 lines; page 5, lines 14-24; claims 1, 2 and 5). Hardening of shaped bodies of the material composition takes place between 200°-600°C (D1, claim 12).

D1 specifies (D1, page 7, last 5 lines and page 8, first 5 lines, also claim 8) the dispersing solution is made by combining phosphate and/or borate containing glasses, a clay containing material, and water under autoclave conditions at 200°C. The dispersing solution of D1 made in this way does not contain any inorganic acid, since no acid has been employed in the process. As a conclusion, the solution of D1 is not acidic. This is obvious for a person skilled in the art.

Furthermore, applicants have found that the alkali silicate ( $\text{pH} \geq 12$ ) is usually present in the D1 process to fabricate the dispersing solution, in order to facilitate the dissolution of phosphate glass and borate glass in water under autoclave conditions (D1, page 5, lines 14-24: dissolution of boric acid in the presence of sodium silicate, all Examples 1-6, pages 12-17). Usually, the presence of sodium silicate will make the solution have a  $\text{pH} > 12$ .

As a matter of fact, the solution of D1 is alkaline ( $\text{pH} > 7$ ) or strongly alkaline ( $\text{pH} > 12$ ). This supposition is supported by D1 Examples (D1, Examples 1-6, pages

12-17), where all the dispersing solutions are strongly alkaline, due to the presence of sodium silicate. Applicants have also repeated the Example 1 (D1, page 12) of D1 in VUB. A test showed that the dispersing solution has a  $\text{pH} \geq 13$ , and the solution has no setting reaction at all with wollastonite at  $20^\circ\text{C}$  at ambient conditions, for a period of 3 months.

Applicants would like to point out that the first fundamental difference between the presently claimed invention and D1 is that the presently claimed invention solution contains phosphoric acid, correspondingly its phosphate aqueous solution has a  $\text{pH} = 0 - 2$ ; whereas D1 solution does not contain any acid, it has the  $\text{pH} > 7$ , preferably  $\text{pH} > 12$ .

Table 1 - Composition Difference

The presently claimed invention		D1 = DE 2356524				
powder	aq. solution, $\text{pH} = 0 - 2$	mineral	aq. solution, $\text{pH} > 7 - 12$ preferably			
wollastonite	phosphate $\text{pH} = 0 - 2$	boron compound	wollastonite of Basalt	alkali silicate	phosphate	borate

Claim 5 of D1 (D1, page 18) states that the "dispersion" consists of 50 wt% of wollastonite. Aluminum phosphate ( $\text{AlPO}_4$ ) and 60 wt% of wollastonite. Aluminium phosphate has many species (Inorganic Phosphate Materials, Chapter 5, Magnesium, Aluminum and Rare Earth Phosphate, By Takafumi Kanazawa, Elsevier, 1989). Their characteristics are very different, the pH value can be either acidic or

alkaline. The AlPO<sub>4</sub> aqueous solution of D1 is strongly alkaline (pH = 10 - 12), and it is a completely different chemical species than an acidic aluminium phosphate solution containing phosphoric acid of the presently claimed invention (comprising, such as AlH<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> • 3H<sub>2</sub>O and H<sub>3</sub>PO<sub>4</sub>).

It is evident from GB 100246 (Barrall, of record) (Example 2, page 7) that the mixture of an acid aluminium phosphate solution and wollastonite in the same proportion as stated by claim 5 of D1 has quick setting properties at room temperature. If D1 used an acidic aluminum phosphate solution containing phosphoric acid to react with wollastonite, a quick setting would follow; whereby, both the object of a homogeneous D1 dispersion, and subsequent hardening at 200-600°C, would become impossible.

Because the dispersing solution of D1 is alkaline, and wollastonite is an alkaline mineral (pH = 10 - 23), the D1 composition comprising the silicate mineral and dispersing solution has no setting reaction at room temperature and below 200°C. Reasonably, D1 requires to cure the composition at a temperature of 200-600°C, in order to have a stable and durable material (D1, page 4 lines 3-8; page 9, line 18; all Examples, claims 12 and 17). Moreover, D1 mentions that a subsequent treatment at 1000°C increases the mechanical properties of the obtained material (D1, page 9, line 27; page 10, line 27; Examples 1 and 4 and claims 14 and 19). Finally D1

mentions that between 140°C and 200°C only a drying occurs, indicated also by a foaming through a subsequent heating between 700°C and 900°C (D1, page 7, line 7; Example 6; claim 20).

Considering all this, and the above-mentioned VUB experiment about reactivity of the Example 1 of D1, applicants respectfully submit that D1 neither teaches nor suggests a setting reaction at all at ambient conditions, nor, there any teaching or suggestion for a retarded setting of the D1 composition at ambient conditions. A retarded setting is a setting process whose setting reaction is retarded for a certain period but will resume spontaneously after the period of retardation, without changing any physical and chemical conditions. To state that D1 has a retarded setting at ambient conditions is not correct. Having the setting reactivity or not at an ambient condition is a fundamental difference in chemistry between the presently claimed invention and D1.

Curing of the presently claimed invention composition is at 20-80° (specification, page 14, lines 9-14). A curing about 100°C may not be desired for the presently claimed invention, in order to avoid boiling of free water from the composition, the presently claimed invention does not specify this condition because we consider this as our know-how. On the other hand, curing temperature of D1 is at 200-600°C, no complete curing occurs below 200°C. This different curing

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temperature is resulted directly from the different compositions of the presently claimed invention and D1, as another proof that the two inventions are not related to each other.

As a further support to state that the presently claimed invention and D1 are fundamentally different, applicants find that products corresponding to the presently claimed invention and D1 are used in different fields of application as well.

The presently claimed invention is mainly a phosphate cement (belongs to Special Cement), it can be a cement related product, a fiber reinforced composite, an adhesive agent curable at ambient temperature conditions, etc. (specification, page 19, whole page; page 20, lines 1-4); while the D1 is in principle a glass, it can be a glass related product, a glaze, a ceramic or a binder made at 200-600°C, or higher.

As performance, the presently claimed invention material is much stronger than that of D1 as shown by their Examples, where the presently claimed invention having a typical bending strength of 18.4 MPa and 12.3 MPa in dry and wet conditions (specification, Example 2, page 22), typical compressive strength of 100 MPa and 85 MPa in dry and wet conditions (not listed in the Example), while D1 has in general a compressive strength in the range of 10-30 MPa (D1, Example 1-6, pages 12-16).

It is indisputable to state that there exists fundamental differences between D1 and the presently claimed invention, in terms of material composition, its pH value, curing process, even the performance of the product and the field of application.

Table 2 - Process and performance differences

	The presently claimed invention	D1 = DE 2356514
making the solution	below 100°C in an atmospheric condition	200°C in autoclave condition
pH of mixture before setting	pH = 0 - 2	pH > 7 - 12
recommended curing temperature	20-80°C, preferably 20°C	200-600°C no setting below 200°C
strength of product (MPa)	bending strength: 12-18 MPa compressive strength: 80-120 MPa	compressive strength 10-30 MPa

Because of the above-mentioned indisputable differences, there is no relevance between the presently claimed invention and D1.

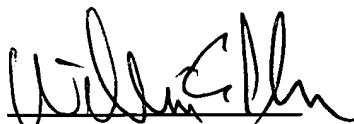
The rejection under 35 USC 102 and 35 USC 103 based on the GB patent specification is rendered moot by canceling claim 19.

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Favorable reconsideration is requested.

Respectfully submitted,

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